

A terrestrial cell site handoff list is dynamically maintained for an airborne cellular system. A beam pattern is maintained relative to an airborne cellular system repeater, but rotates relative to the geographic area of coverage. A location and heading of the airplane, locations of respective beams transmitted from the airplane based on airplane flight pattern data, and locations of respective cell sites within a vicinity of footprints of the respective beams transmitted from the airplane are determined. A list of viable handoff terrestrial cell site candidates is then calculated based on the beam pattern, the location and heading of the airplane, the locations of respective beams transmitted from the airplane based on airplane flight pattern data, and the locations of respective cell sites.